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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/581,878	09/11/2000	Tadahiro Ohmi	FUK-71	7595

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RANDALL J. KNUTH P.C.
4921 DESOTO DRIVE
FORT WAYNE, IN 46815

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/581,878

Applicant(s)

OHMI ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY-(30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/11/05 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-10, and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., U.S. Patent 5,580,420 in view of Takahashi, U.S. Patent 5,314,574.

Watanabe et al. shows the invention substantially as claimed including a semiconductor manufacturing apparatus for processing a substrate surface (see col. 1, lines 6-14), the apparatus comprising: a vacuum vessel 6 having an upper vacuum vessel plate 3,66 and a lower vacuum vessel plate; a bottom plate 31 in which a substrate stage is provided (see figs. 1 and 4); two cylinders 15 installed surrounding the substrate stage (see col. 10, lines 28-35, and figs. 1 and 4); a gap between the cylinders and the top vacuum vessel plate is made variable by lifting/lowering the cylinder (see col. 7, lines 20-22); the cylinders having a lifting/lowering mechanism 36 (see col. 10, lines 28-35, and figs. 1 and 4) in order to separate a space which the cylinder surrounds comprising a processing chamber 6 from the space outside the cylinder including a transport chamber 32 for transferring the substrate and provided with a substrate conveyer mechanism 10, 101 for transferring the substrate between the processing chamber and the transport chamber through the gap (see col. 6-line 63 to col. 7-line 25); the processing chamber is provided with a processing chamber gas inlet and a gas outlet (see col. 9, lines 55-62).

Watanabe et al. does not expressly disclose that the transport chamber is provided with a gas inlet and a gas outlet, that the cylinders are provided with an O-ring, and that a bellows extends between the cylinder and the lower vacuum vessel plate.

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Takahashi discloses an apparatus in which the transfer chamber comprises a gas inlet for supplying nitrogen gas and a gas outlet connected to an exhaust system in order to set a vacuum atmosphere (see col. 5, lines 24-36 and fig. 8). Therefore, in view of this disclosure it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to further comprise a gas inlet and a gas outlet in the transfer chamber in order to set a vacuum atmosphere.

Furthermore, Takahashi discloses the use of O-rings 21 for tightly sealing the chamber and the use of bellows 22 connected to the bottom plate 23 for freely expanding and contracting the lifting/lowering mechanism of the cylinders (see col. 4, lines 27-53). Therefore, in view of this disclosure it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Watanabe et al. as to further comprise the claimed O-ring and bellows in order to optimize the apparatus by tightly sealing the chamber and by freely expanding and compressing the lifting/lowering mechanism.

With respect to the substrate stage having an operatively immovable substrate receiving portion, it should be noted that such limitation is directed to a method limitation instead of an apparatus limitation, and since an apparatus is being claimed as the instant invention, the method teaching are not considered to be the matter at hand since a variety of methods can be performed in the apparatus. The apparatus of Watanabe modified by Takahashi et al. is capable of having an operatively immovable substrate receiving portion during processing. Furthermore, regarding claims 12 and 13, note that

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the upper end of the substrate stage(s) is capable of being the immovable substrate receiving portion.

With respect to claims 3 and 8, note that the apparatus of Watanabe et al. shows a vacuum vessel 1 which has a modular configuration, the modular configuration including a first modular unit having said processing chamber 6 and a second modular unit having a substrate transport mechanism 32 (see figs. 1 and 4). Furthermore, with respect to claims 4, 6-7 and 9-10, the Watanabe et al. reference further discloses that the apparatus comprises a microwave plasma generation mechanism for generating plasma in the processing chamber, magnetic field generating means 651-653 disposed substantially on the circumference surrounding the chamber in the atmosphere outside of the vacuum vessel, and radio frequency power source 610 provided to the substrate stage (see the abstract, col. 1-line 65 to col. 2-line 10, col. 9, line 24-62, and figs. 1 and 4).

Watanabe et al. does not expressly disclose that the magnetic field generating means are permanent magnets but it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to comprise permanent magnets as the magnetic field generation means because permanent magnets are known in the art to be suitable means for generating a magnetic field and therefore their use in the apparatus of Watanabe et al. would be prima facie obvious in absence of evidence of unexpected results.

Concerning claims 12-15 and with respect to the substrate receiving portion being fixedly and permanently stationarily disposed relative to the vacuum vessel lower

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plate, it should be noted that there is no evidence that the choice of a particular arrangement of the substrate stage would significantly affect the overall performance of the plasma processing apparatus (once the substrate stage is in place the substrate processing in the apparatus of Watanabe et al. modified by Takahashi would be no different than the substrate processing in the apparatus of the instant invention). Therefore, such limitation would not lend patentability to the instant application absent the showing of unexpected results

Claim 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., U.S. Patent 5,580,420 in view of Takahashi, U.S. Patent 5,314,574. as applied to claims 1-4, 6-10, and 12-15 above, and further in view of Masahiro et al., JP 10-177994.

Watanabe et al. and Takahashi do not expressly disclose that the plasma generation mechanism radiates microwave through a slot antenna. Masahiro et al. discloses a plasma treating device utilizing a microwave plasma generating device comprising a slot antenna 202 to perform uniform plasma treatment (see abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Watanabe et al. as to comprise a microwave plasma generation mechanism which comprises a slot antenna in order to optimize the apparatus by performing uniform plasma treatments with high reproducibility since the microwave can be radiated stably.

Response to Arguments

Applicant's arguments filed 8/11/05 have been fully considered but are not deemed persuasive. In response to applicant's argument that the Watanabe et al. and Takahashi references are not physically combinable, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the Watanabe et al. and Takahashi references is clearly stated in the above rejection under 35 USC 103.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-

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1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luz L. Alejandro
Primary Examiner
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September 16, 2005